No. 793,604. Patented June 27, 1905.

UNITED STATES PATENT OFFICE.

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ABRADING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 793,604, dated June 27, 1905.

Application filed March 18, 1902. Serial No. 98,780.

To all whom it may concern:

Be it known that I, WILLIAM EMERY NICKERSON, a citizen of the United States, residing at Cambridge, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Abrading-Machines, of which the following is a specification.

My invention relates to the art of grinding and polishing, my object being to provide a machine by means of which razor-blades may be ground and given a satisfactory cutting edge.

So far as I am aware, it has not been found practicable hitherto to grind razor-blades by automatic machinery, mainly by reason of the difficulty encountered in devising a mechanism which would apply a blade to the abrading-surface with the requisite delicacy and uniformity of pressure and insure the necessary uniformity of the abrading action along the entire length of the blade, as well as on both sides thereof, and an important portion of my invention relates to means whereby this result may be accomplished.

Other features of my invention relate to the organization of a grinding-machine as a whole and to the construction of some of its details hereinafter described.

My invention is particularly intended to provide a machine for grinding thin flat blades, such as used in the safety-razor shown and described in Letters Patent of the United States No. 775,134, granted November 15, 1904, on an application filed by King C. Gillette, and such a machine is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the complete machine in its preferred form. Fig. 2 is a central vertical section through the body portion of the machine. Fig. 3 is a view, partly in central vertical section and partly in side elevation, of the upper portion of the central axis of the machine and adjacent parts. Fig. 4 is a section taken on the line 4 4 in Fig. 3. Fig. 5 is a plan view showing two adjacent grinding-wheels and a coöperating blade-carrier. Fig. 6 is an end elevation of a blade-holder, hereinafter described, containing an unground blade; and Fig. 7 is a side elevation of the parts shown in Fig. 6. Fig. 8 is a plan view of one of the blades above referred to. Fig. 9 is a view, principally in central vertical section, showing a modified construction of my apparatus; and Fig. 10 is a plan view of a portion of the table shown in Fig. 9. Fig. 11 is a detail view in central vertical section, showing another modification.

My apparatus is preferably so organized as to be capable of grinding a number of blades at once, and to this end I provide a circular table 2, supported on suitable legs 3 and having an upwardly-extending rim 4, thus giving the top of the table the form of a shallow receptacle, the bottom 5 of which preferably slopes downward toward its center for a purpose which will presently appear. Near the rim of the table is located a circular series of rotatable abrading-wheels 6 of a character suitable for the work to be done, each of said wheels 6 being detachably secured to a spindle 7, journaled vertically in suitable bearings 8, carried by the table 2, as shown in Fig. 2. In order that the wheels 6 may be rotated simultaneously, each spindle 7 is provided near its lower end with a gear 9, meshing with a single central gear 10, which is secured to the lower end of a vertical shaft 11, the latter being supported and driven as hereinafter described.

At a suitable distance from each abrading-wheel 6 is located a device for carrying a blade-holder and blade and applying the latter to the abrading-surface. This blade-carrier forms an important feature of my invention and is so constructed and arranged that it will hold a blade against the abrading-surface with a degree of pressure which may be accurately and minutely regulated. To this end my blade-carrier preferably consists of a cap 12, mounted loosely on a vertical spindle 13 and supported on a friction pad or disk 14, of leather or other suitable material, which rests upon a collar 15, rigidly secured to the spindle 13, the latter being journaled in bearings 16, which are carried by the table 2 and